

DWFR TUBING

Dual Wall, Heat Shrink Tubing
Highly flame-retardant, UL VW-1 rated



DWFR tubing from TE Connectivity (TE) is a highly flame-retardant, high-shrink ratio, adhesive-lined tubing made from a polyolefin jacket with a thermoplastic adhesive inner wall. It insulates and environmentally seals and protects components and other electrical connections and terminations. DWFR's medium wall thickness provides increased mechanical protection. Its high shrink ratio allows DWFR to cover a variety of substrates with a limited number of tubing sizes. It is suitable for sealing and protection of connector-to-cable transitions and repairing damaged cable jackets. It can also be used to create and seal breakouts in harnesses.

KEY FEATURES

- Highly flame-retardant with UL VW-1 flammability rating
- 3:1 and 4:1 shrink ratios provide design versatility
- Moisture-resistant seal
- Withstands mechanical stress for increased product reliability

APPLICATIONS

- Household appliances
- Automotive
- Commercial electronics and communications
- Consumer products
- Industrial equipment

MATERIALS

- Irradiated polyolefin jacket
- Thermoplastic adhesive inner wall

ELECTRICAL

- Provides excellent electrical insulation

MECHANICAL

- Medium wall jacket provides mechanical protection from abrasion and bending
- Adhesive liner bonds to a variety of substrate materials, providing protection from moisture ingress

TEMPERATURE RATING

- Minimum shrink temperature: 60°C [140°F]
- Full recovery temperature: 110°C [230°F]
- Operating temperature: -40°C to 110°C [-40°F to 230°F]

STANDARDS AND SPECIFICATIONS

- Customer drawing: DWFR
- UL 224 VW-1
- UL file E35586
- Submitted for CSA Certification

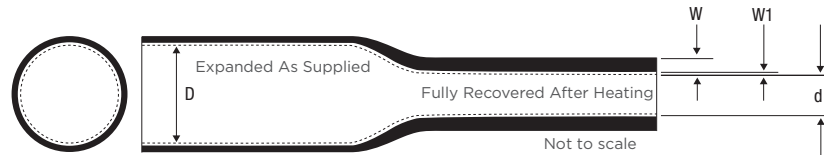
ORDERING INFORMATION

- Color: Black (-0)
- Standard packaging (-STK): 1.2m [4ft] lengths
Optional special order packaging (-SP): Spool, varying lengths (consult TE for details)
- Ordering description: Specify product name, size, color and packaging. For example, DWFR-3/1-0-STK

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Dual Wall, Highly Flame-Retardant Heat Shrink Tubing

DIMENSIONS



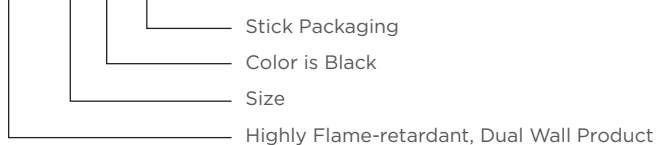
Shrink Ratio	Size	Minimum Expanded I.D. (D)	Maximum Recovered I.D. (d)	Total Recovered Wall Thickness (W)	Minimum Recovered Inner Melttable Wall Thickness (W1)
3:1	3/1	3.0 [0.118]	1.0 [0.039]	1.12 ± 0.25 [0.044 ± 0.010]	0.25 [0.010]
	6/2	6.0 [0.236]	2.0 [0.079]	1.14 ± 0.25 [0.045 ± 0.010]	0.25 [0.010]
	9/3	9.0 [0.354]	3.0 [0.118]	1.40 ± 0.25 [0.055 ± 0.010]	0.56 [0.022]
	12/4	12.0 [0.472]	4.0 [0.157]	1.78 ± 0.36 [0.070 ± 0.014]	0.58 [0.023]
	19/6	19.0 [0.748]	6.0 [0.236]	2.25 ± 0.50 [0.088 ± 0.020]	0.58 [0.023]
	24/8	24.0 [0.945]	8.0 [0.315]	2.54 ± 0.50 [0.100 ± 0.020]	0.79 [0.031]
	40/13	40.0 [1.575]	13.0 [0.512]	2.54 ± 0.50 [0.100 ± 0.020]	0.86 [0.034]
4:1	4/1	4.0 [0.157]	1.0 [0.039]	1.12 ± 0.25 [0.044 ± 0.010]	0.25 [0.010]
	8/2	8.0 [0.315]	2.0 [0.079]	1.14 ± 0.25 [0.045 ± 0.010]	0.25 [0.010]
	12/3	12.0 [0.472]	3.0 [0.118]	1.40 ± 0.25 [0.055 ± 0.010]	0.56 [0.022]
	16/4	16.0 [0.630]	4.0 [0.157]	1.78 ± 0.36 [0.070 ± 0.014]	0.58 [0.023]
	24/6	24.0 [0.945]	6.0 [0.236]	2.25 ± 0.50 [0.088 ± 0.020]	0.58 [0.023]
	32/8	32.0 [1.260]	8.0 [0.315]	2.54 ± 0.50 [0.100 ± 0.020]	0.79 [0.031]
	52/13	52.0 [2.047]	13.0 [0.512]	2.54 ± 0.50 [0.100 ± 0.020]	0.86 [0.034]

PRODUCT DESCRIPTION AND ORDERING INFORMATION

Shrink Ratio	Material Description	Material Number
3:1	DWFR-3/1-0-STK	EG3298-000
	DWFR-6/2-0-STK	EG3300-000
	DWFR-9/3-0-STK	EG3302-000
	DWFR-12/4-0-STK	EG3304-000
	DWFR-19/6-0-STK	EG4298-000
	DWFR-24/8-0-STK	EG4302-000
	DWFR-40/13-0-STK	EG4306-000

Shrink Ratio	Material Description	Material Number
4:1	DWFR-4/1-0-STK	EG3299-000
	DWFR-8/2-0-STK	EG3301-000
	DWFR-12/3-0-STK	EG3303-000
	DWFR-16/4-0-STK	EG3305-000
	DWFR-24/6-0-STK	EG4300-000
	DWFR-32/8-0-STK	EG4304-000
	DWFR-52/13-0-STK	EG4308-000

DWFR-3/1-0-STK



PROPERTY REQUIREMENTS

Property	Unit	Requirement	Test Method
Physical			
Dimensions*	mm [in]	As shown in DIMENSIONS table	ASTM D 2671
Longitudinal Change	Percent	0, -15%	ASTM D 2671
Tensile Strength*	psi (MPa)	1500 (10.3) minimum	ASTM D 2671
Ultimate Elongation*	Percent	200 minimum	ASTM D 2671
Secant Modulus (Expanded)	psi (MPa)	2.5×10^4 (172) maximum	ASTM D 882, 2% strain
Cold Bend Test at $-30 \pm 1^\circ\text{C}$ ($-22 \pm 1.8^\circ\text{F}$) for 1 hour	-	No cracking	UL 224, section 5.9
Heat Shock* 4 hours at $250 \pm 1^\circ\text{C}$ ($482 \pm 1.8^\circ\text{F}$)	-	No dripping, flowing or cracking of outer wall	UL 224, section 5.8
Heat Resistance 168 hours at $158 \pm 2^\circ\text{C}$ ($347 \pm 4^\circ\text{F}$) followed by test for Tensile strength Elongation	psi (MPa) Percent	70% of original minimum 100% minimum	UL 224
Sealing Efficiency	-	No openings on reheat	AMS-DTL 23053/4
Electrical			
Dielectric Strength	Volts/mil (V/mm)	300 (11,811) minimum on dual wall specimen	ASTM D 2671
Volume Resistivity	ohm/cm	10^{14} minimum on dual wall specimen	ASTM D 2671
Chemical			
Copper Mirror Corrosion 16 hours at $121 \pm 2^\circ\text{C}$ ($250 \pm 4^\circ\text{F}$)	-	No removal of copper	ASTM D 2671, Procedure A
Copper Contact Corrosion 16 hours at $121 \pm 2^\circ\text{C}$ ($250 \pm 4^\circ\text{F}$)	-	No pitting or blackening of copper	ASTM D 2671, Procedure B
Flammability	-	Pass	UL 224, VW-1
Water Absorption 24 hours at 23°C (73°F)	Percent	0.5 maximum	ASTM D 2671

* Denotes Lot Acceptance Test

For More Information

Visit www.te.com and enter search term “DWFR” or visit www.te.com/DWFRtubing

TE Technical Support Center

USA: +1 (800) 522-6752
Canada: +1 (905) 475-6222
Mexico: +52 (0) 55-1106-0800
Latin/S. America: +54 (0) 11-4733-2200
China: +86 (0) 400-820-6015
Germany: +49 (0) 6251-1333-1999
UK: +44 (0) 800-267666
France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999

For phone numbers in other countries, go to te.com/support-center

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